

# (12) UK Patent Application (19) GB (11) 2 091 571 A

(21) Application No 8200818  
(22) Date of filing 12 Jan 1982  
(30) Priority data

(31) 56/003543U  
(32) 13 Jan 1981

(33) Japan (JP)

(43) Application published  
4 Aug 1982

(51) INT CL<sup>3</sup>  
A63H 27/12

(52) Domestic classification  
A6S 11C4

(56) Documents cited  
GB 614179

(58) Field of search  
A6S

(71) Applicants  
Masudaya Corporation  
Limited,  
6-4, 2-chome, Kuramae,  
Taito-ku, Tokyo, Japan

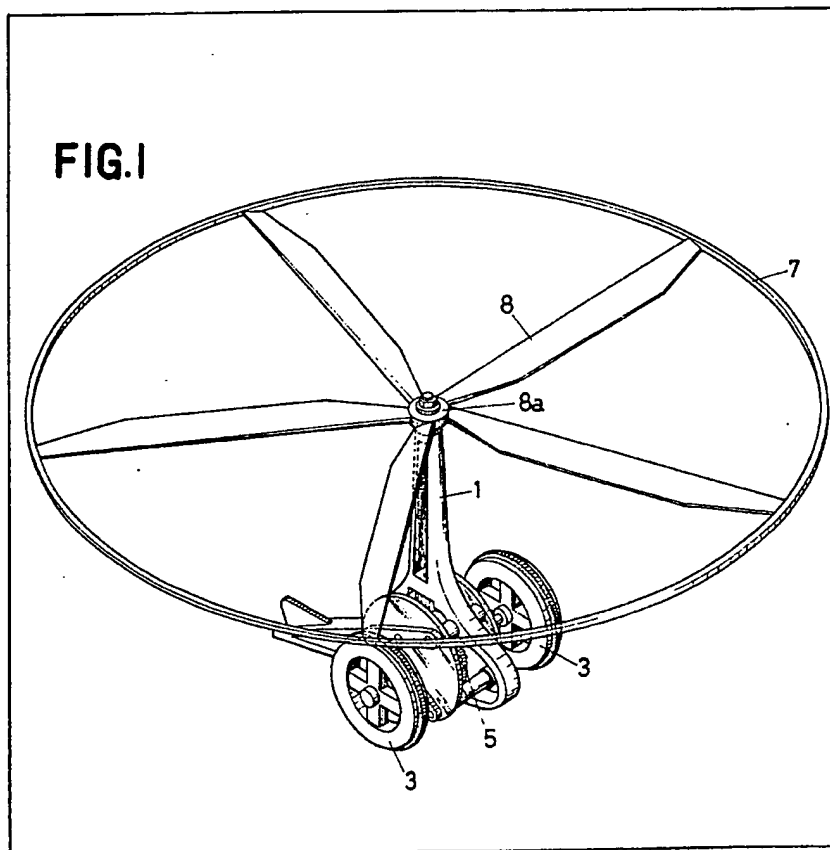
(72) Inventor  
Masao Shimizu

(74) Agents  
Stanley, Popplewell,  
Poole,  
54 New Cavendish Street,  
London W1M 8HP

## (54) Flying toy

(57) A flying toy comprises a body 1 carrying wheels 3 on an axle journaled in the body, and a rotary wing 8 on a further axle. Rotation of wheels 3 by moving contact with a surface is transmitted to wing 8 via gearing 5 which increases the speed of rotation during transmission. A tail

is grippable and located distal of the wing to avoid interference therewith by the user. The toy is run along the ground to rotate the wheels 3 to cause faster rotation of the wing 8, on releasing the toy it may slide a short distance on the tail which forms a skid, before soaring into the air. Wing 8 has a plurality of radially extending blades and an inertia ring 7 to provide for continued rotation.



GB 2 091 571 A

FIG.1

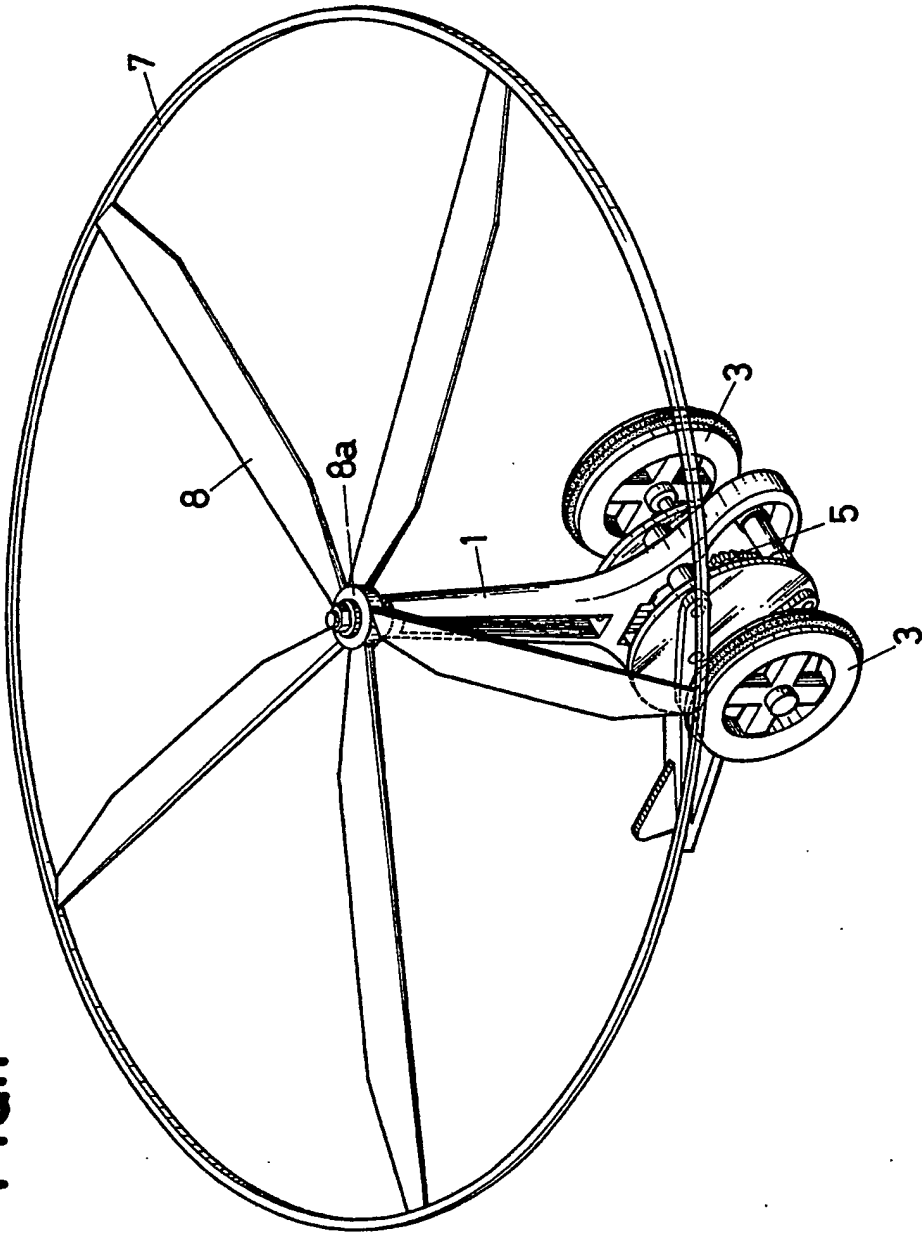
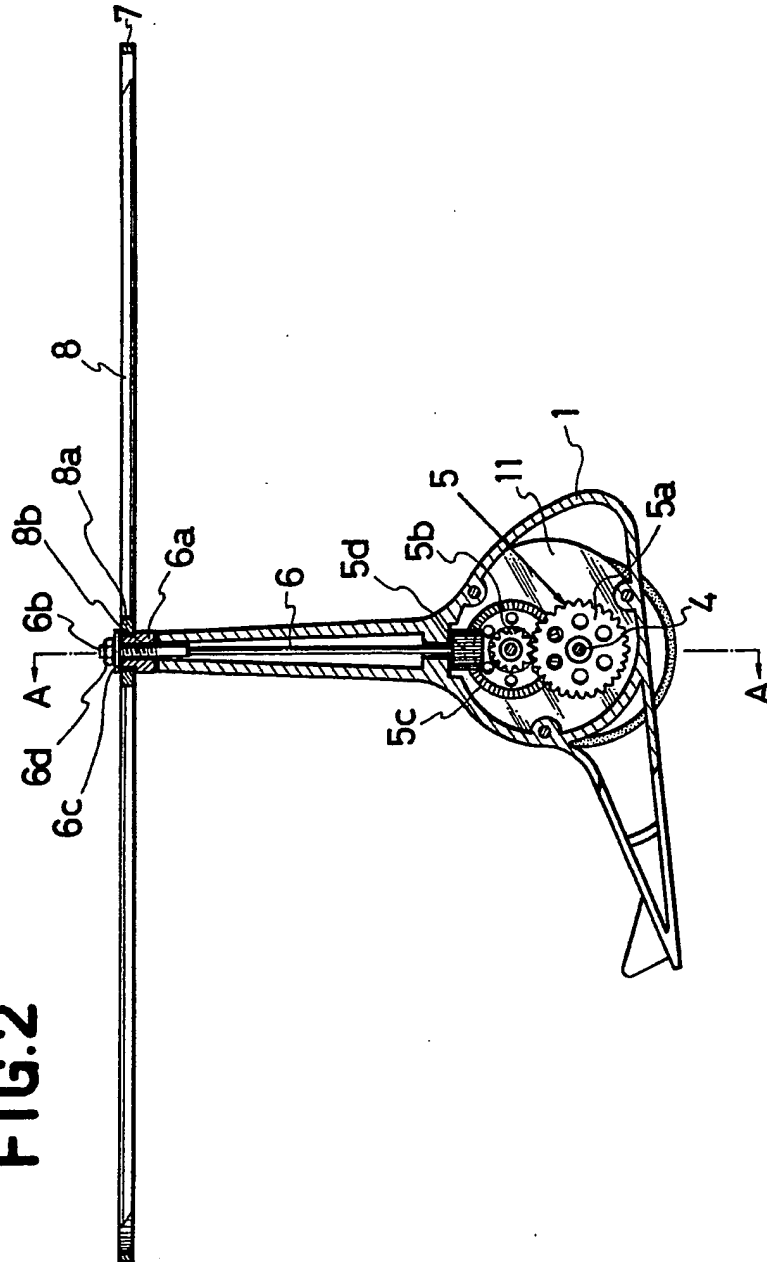


FIG.2



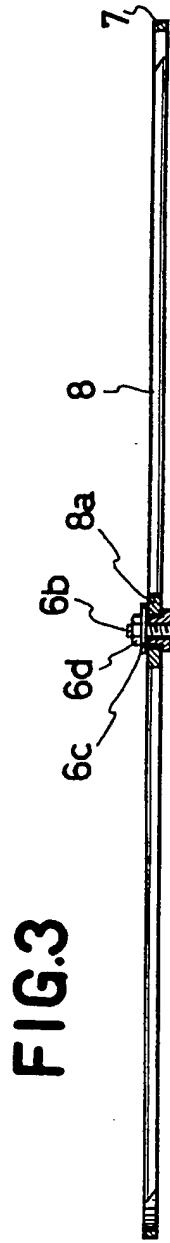


FIG. 3

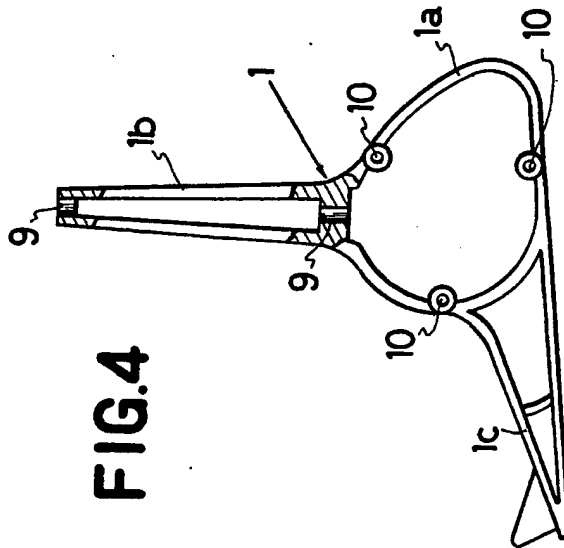
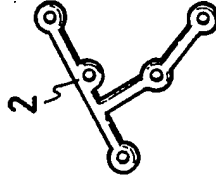


FIG. 4

FIG. 5



# SPECIFICATION Flying toy

The present invention relates to a flying toy. In particular it provides a toy which may soar up in the air from travelling on a flat floor being powered by rubbing wheels against the floor by hand so as to run on the floor.

The present invention provides a toy adapted to fly, comprising a body, a wheel mounted on the body and adapted to be rotated by rubbing against a surface, a rotatable wing mounted on the body, gearing means connecting said wheel and said wing to transmit rotation of said wheel to said wing, the arrangement being such that rotation of said wheel causes rotation of said wing to cause the toy to fly. More particularly there is provided a flying toy comprising a body, a pair of wheels and a rotary wing in appearance. Said body is constructed with a body frame, a pair of supporting frames and a pair of covers. Said body frame is constituted of a fuselage, a support and a tail as an united member. Said fuselage holds an axle provided with a pair of the wheels at both ends of the axle and houses a speed increasing gearing connecting with the axle. Such support has a rotary shaft journaled in it. Said rotary shaft is adapted to be rotated by the speed increasing gearing which is actuated by the wheels which are rotated by rubbing them forward, so as to run, on a flat floor. The support has the rotary wing fixed onto its upper end which is distant from the fuselage. Said tail is a skid of the body and has a fin which is a grip to be pinched by fingers. In such a mechanism of the present flying toy as described above, if the flying toy is pinched by hand at the fin of it and its wheels are rubbed forward so that it runs on a floor and then the hand separates from it and releases it on the floor, it may take off instantly from sliding and soar up in the air.

Thus present invention aims to provide a flying toy which causes children to run about outdoors so as to enjoy a flight of it in the air.

The invention will now be more particularly described by way of example only by reference to the accompanying drawings wherein:

Figure 1 is a perspective view of a flying toy according to the present invention;

Figure 2 is a partially cut away side elevational view thereof;

Figure 3 is a sectional view cut along line A—A in Figure 2;

Figure 4 is a side view of a body of the device of Figure 1; and

Figure 5 is a side view of a supporting frame of the device of Figure 1.

Referring to the drawings, a body frame 1 is a main structural part of a flying toy which comprises a fuselage 1a, a support 1b and a tail 1c. Said fuselage 1a is rounded fore and aft and is provided with a pair of supporting frames 2 on both sides of it, and an axle 4 is journaled in the frame, having a wheel 3 fixed onto each end of said axle 4. The fuselage 1a houses gearing 5 connected with the axle 4. The support 1b extends

vertically upward from the top of the fuselage 1a and a rotary shaft 6 is journaled therein at the upper and lower regions. The rotary shaft 6 carries a pinion 5d at a lower end, the pinion meshing with a crown gear 5c of gearing 5, and is provided with a rotatable wing 8 on the top of the said rotary shaft 6. The wing 8 comprises a plurality of blades, a boss 8a and an inertia ring 7. The blades of the wing 8 are fixed to the ring 7 at equally spaced intervals at their tips and are affixed to the boss 8a at their roots. The tail 1c extends rearwardly from the rear of the fuselage 1a, forming a skid of the toy. The body frame 1, which comprises the fuselage 1a, the support 1b and the tail 1c, can be produced as a single piece of synthetic plastics material by injection moulding. The fuselage 1a has a plurality of attachment holes 10 at both sides of it to attach the pair of supporting frames 2. The support 1b has a pair of journal bearing holes 9 to receive the rotary shaft 6. These holes can be journal during the injection moulding of the body frame 1. Turning to the gearing 5, a gear wheel 5a mounted on the axle 4 engages with a pinion 5b which is rotationally fast with the crown gear 5c, and said crown gear 5c engages with the pinion 5d which is attached to the lower end of the rotary shaft 6. Therefore, rotation bestowed to the wheels 3 by rubbing wheels 3 against a floor is transmitted to the rotary shaft 6 with an increased speed of rotation through the speed increasing gearing 5. The boss 8a of the rotary wing 8 has a square section hole 8b which receives a square section head 6a attached to the upper end of the rotary shaft 6. The use of a square section in boss 8a ensures good transmission of rotation from shaft 6 to the wing 8. The rotary wing 8 is fixed to the rotary shaft 6 by screwing a nut 6a onto a projecting threaded shaft 6b with intermediation of a washer 6c. Each of the supporting frames 2 is respectively provided with a cover 11 inside it so as to protect the gearing 5 in the fuselage 1a.

With the embodiment as particularly described above, the toy may be rubbed forward against the flat floor on the pair of wheels 3 so as to run forward, and the rotation of the wheels 3 is transmitted to the rotary wing 8, the speed of rotation of the wing being greater than that of the wheels through the speed increasing gearing 5. As the rotary wing 8 rotates more and more fast by rubbing repeatedly the wheels 3 against a floor, the toy bears a buoyancy in the air and then if it is released from hand, it will soar up instantly in the air sliding a little on the floor. The rotary wing 8 has the inertia ring 7 as a circumferential brim, so the toy will stay in the air by the continued rotation of the wing due to its inertia of rotation. When the rotary wing 8 slows due to friction, it will lose height and descend to the ground.

As the present invention has been particularly described hereinbefore, the body frame is constructed with the fuselage, the support and the tail as a main part. The fuselage is provided with a pair of wheels, the axle and the speed increasing gearing in connection with said axle. The rotary

wing is pivoted on the upper end of the rotary shaft in the support. The tail is fully distanced from the using so that the wing will not be touched when the tail is seized by hand and the tail has a  
 5 fin which forms a grip of the toy which can be pinched by fingers. If the wheels are repeatedly rubbed forward against the flat floor while inclining the toy forward in the direction of rubbing so as to obtain the airlift and to run on the flat  
 10 floor, then the rotary wing may speedily rotate to soar up in the air when the toy is released from the hand. The appearance of the present toy is that of a real helicopter from its body, because it may take off while sliding a little on the flat floor by increasing the rotation speed of the rotary wing  
 15 and may soar up at a breath in the air. Thus the present toy provides a real and amusing flight which may give much joy and delight to children at outdoor play.

20 While a particular embodiment of the present flying toy has been illustrated and described, it is clear that many modifications and variations are possible in the light of the above teachings. It is, therefore, to be understood that within the scope  
 25 of the appended claims the invention may be practised otherwise than as specifically described.

#### CLAIMS

1. A toy adapted to fly, comprising a body, a  
 30 wheel mounted on the body and adapted to be rotated by rubbing against a surface, a rotatable wing mounted on the body, gearing means connecting said wheel and said wing to transmit rotation of said wheel to said wing, the arrangement being such that rotation of said  
 35 wheel causes rotation of said wing to cause the

toy to fly.

2. A toy as claimed in claim 1, wherein said gearing is adapted to provide an increased speed of rotation of the wing relative to the wheel.

40 3. A toy as claimed in claim 1 or 2, wherein, said wing comprises a boss, a plurality of blades extending radially outward from the boss, and an inertia ring mounted on ends of the blades, distal of the boss.

45 4. A toy as claimed in claim 1, 2 or 3, wherein said body has a tail portion extending therefrom to enable helicopter like flight of the toy and grippable to assist in operation of said toy.

50 5. A toy comprising a body, a pair of wheels and a rotatable wing, said body comprising a body frame, a pair of support frames and a pair of covers, said body frame having a fuselage, a support and a tail, said fuselage holding an axle provided with a wheel at each end of the axle and  
 55 housing a speed increasing gearing connected with said axle, said support having a rotatable shaft journaled in it, said rotatable shaft being adapted to rotate with an increasing speed which is transmitted to its lower end from the wheels  
 60 through the speed increasing gearing and having the rotary wing fixed onto its upper end which is distal of the fuselage, said tail forming a skid of the body and having a fin which forms a grip which can be pinched by fingers so that the wheels may  
 65 be rubbed forward against a flat plane to bestow rotation to the wheels and thence to the wing and thereby the toy being adapted to run on, to take off the flat plane and to fly in the air.

70 6. A toy substantially as hereinbefore described with reference to, and as illustrated in, the accompanying drawings.